

that requires a step of "mixing particles of a metal powder with a lubricant ... *and a least one liquid phase former to form a mixture*"(emphasis added). That is to say, step 1 requires mixing (1) a metal powder; (2) a lubricant; and (3) at least one liquid phase former to form a mixture. Since Hill does not describe or teach mixing of a liquid phase former with the metal powder and lubricant, Hill does not disclose the process substantially as claimed. For this reason alone, a rejection of claim 1 over the teachings of Hill and Ozaki is not warranted pursuant to the provisions of 35 U.S.C. 103.

Hill describes a process of first compacting a mixture of ferrochrome and metallic binder powders with or without the aid of a lubricant. (Column 3, lines 41 to 60) Thereafter, the lubricant is driven off before heating of the compact to a temperature within the range of 1850° to 2400°F. (Column 3, lines 60 to 62) Thus, Hill teaches that if a lubricant is used, it is removed before subjecting the compact to a heating step.

Ozaki describes a compaction process for producing a compact of a high density before sintering. There is no description of any further treatment of the [green] compact.

It is understood that the Examiner believes that it would be obvious from Ozaki to modify the Hill process by using lauric acid as a lubricant to improve the flowability of the mixture and to add nickel and/or boron powders to improve the alloy characteristics of the formed base material. However, in such a modified process, the lubricant with lauric acid would be driven off from the [green] compact prior to any sintering step pursuant to the teachings of Hill. Maintaining a lubricant within the compact during heating would be contrary to the teachings of Hill. Thus, the modified process would not result in the claimed process. For this additional reason, a rejection of claim 1 over the teachings of Hill and Ozaki is not warranted pursuant to the provisions of 35 U.S.C. 103.

The Examiner alleges that the modified process of Hill would result in a compressed and sintered product having a density of 99+% of theoretical density. However, the Examiner has not provided a *prima facie* showing that the modified process of Hill would result in a product with such a density. The examiner bears the initial burden of factually supporting any *prima facie* conclusion of obviousness. (MPEP 2142) In relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art. *Ex parte Levy*, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990) (emphasis in original). (MPEP 2112, IV) Further, neither Hill nor Ozaki teaches a density of 99+% of theoretical density.

The Examiner's citation of MPEP 2131.03 appears to be misplaced as this section deals with anticipation of ranges.

Claims 2 to 10 depend from claim 1 and are believed to be allowable for similar reasons.

Claim 6 depends from claim 1 and further recites that the mixture [of metal powder, lubricant and liquid phase former] is compressed through high velocity compaction. Neither Hill nor Ozaki describes or teaches such a step. Accordingly, a rejection of Claim 6 as being unpatentable over the teachings of Hill and Ozaki is not warranted pursuant to the provisions of 35 U.S.C. 103.

Claim 7 depends from claim 1 and further recites that the mixture is compressed under a compaction pressure greater than 45 tons per square inch. Hill teaches compaction in a range of from 10 to 40 tons per square inch (column 3, line 55). There

is no teaching in Hill or Ozaki of using a compaction pressure greater than 45 tons per square inch. Accordingly, a rejection of claim 7 as being unpatentable over the teachings of Hill and Ozaki is not warranted pursuant to the provisions of 35 U.S.C. 103.

Claim 1 has also been rejected as being unpatentable over Hill in view of Luk on the basis that Luk describes a lubricant that employs lauric acid and graphite and that it would be obvious to employ this lubricant as a lubricant in Hill. Issue is taken in this respect.

First, the lubricant composition described in Luk is to be applied to the walls of a compaction die **before** a powder composition is charged into the die for subsequent compaction (see column 2, lines 52-55). There is no teaching that the lubricant composition can be incorporated into the powder. Thus, there is no teaching in Luk that would motivate one of ordinary skill in the art to modify the process of Hill to incorporate the lubricant of Luk in the ferrochrome/binder mixture of Hill. Furthermore, if such a lubricant were incorporated into the powder mixture of Hill, the lubricant would be removed prior to heating of the compact to a range of 1850° to 2400°F. Accordingly, a rejection of claim 1 as being unpatentable over the teachings of Hill and Luk is not warranted pursuant to the provisions of 35 U.S.C. 103.

Claims 2 to 10 depend from claim 1 and are believed to be allowable over the teachings of Hill and Luk for reasons as expressed above.

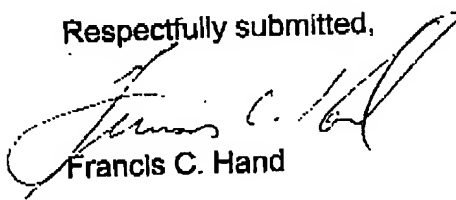
Claim 11 is directed to "A product made in accordance with the process of claim 1". Accordingly, the requirement for restriction on the basis that the product can be made by another process is not appropriate for claim 11 and should be withdrawn.

Claims 12 to 24 have been retained in the application pending allowance of claim

1. None of the prior art of record describes or teaches a powder metal product having a density of 99+% of theoretical nor of any method for obtaining such a product. Thus, it is submitted that the process of claim 1 is the only known process for obtaining the product of claim 12.

The application is believed to be in condition for allowance and such is respectfully requested.

Respectfully submitted,



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